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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/045,895 | 10/29/2001 | Stephen Keeta Park | 2000.029996/TT3586C | 3826 |

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HOUSTON, TX 77042

EXAMINER

LEE, HSIEN MING

| | |
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| ART UNIT | PAPER NUMBER |
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2823

DATE MAILED: 05/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/045,895

Applicant(s)

PARK, STEPHEN KEETAI

Examiner

Hsien-Ming Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20, 41 and 42 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20, 41 and 42 is/are rejected.
- 7) ☒ Claim(s) 6, 11, 16 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4 6) ☐ Other

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: the "CROSS RELATED APPLICATION DATA" is not complete, i.e. " ...09/493,384, filed January 28, 2000, now U.S. Patent No. _____" should be -- 09/493,384, filed January 28, 2000, now U.S. Patent No. **6,355,555** --. Appropriate correction is required.

Claim Objections

2. Claims 6, 11 and 16 are objected to because of the following informalities: in-consistent terminology, i.e. "a structure layer" (claim 11, line 2) versus "the structure" (claim 11, line 16).

Claim 6, at line 4 and claim 16, at line 4, "high dielectric constant (high K), where K" should be -- high dielectric constant (high K) **material**, wherein K--. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1 and 7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, at line 6, "forming an opening in the sacrificial dielectric layer" renders indefinite because it is unclear whether "the sacrificial dielectric layer" refers to "first sacrificial dielectric layer" or "second sacrificial dielectric layer." The same problem also appears in claim 7, line 4.

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Double Patenting

5. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

6. Claims 1-22 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-20 of U.S. Patent No. 6,355,555 in view of Boeck et al. (US 5,880,018).

U.S. Patent No. 6,355,555 claims a common subject matter as claimed, i.e. the subject matter as recited in claims 1-20 of the Patent are equivalent to that of claims 1-20 of the present application. The Patent does not claim forming the first sacrificial dielectric layer *adjacent a contact, i.e. an intermetal via connect*.

Boeck et al. in an analogous art teach a method comprising : (a) forming a sacrificial dielectric layer 18 above a structure layer 16/12 and *adjacent to a contact, i.e. the copper intermetal via connect 14/20 (Fig. 1)*; (b) forming an opening in the sacrificial dielectric layer 18; (c) forming at least one barrier metal layer (Ta: see col. 4, lines 20-28) above the sacrificial dielectric layer 18 and in the opening; (d) depositing copper layer above the at least one barrier metal layer (Ta) in the opening; (e) forming the copper interconnect by removing the copper layer and the at least one barrier metal layer above the sacrificial dielectric layer 18 by CMP

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technique, leaving the copper interconnect 20 in the opening (Fig.3); (f) removing the sacrificial dielectric layers 18 above the structure layer and adjacent the copper interconnect (Fig. 4); and (g) forming a low dielectric constant dielectric layer 22 by chemical vapor deposition above the structure layer and adjacent the copper interconnect (Fig. 5).

Therefore, it would have been obvious to one of the ordinary skill in the art, at the time the invention was made, to form the first sacrificial dielectric layer adjacent to the contact as taught by Boeck and further proceed to the subsequent processing steps of the Patent since by this manner it would provide a satisfactory method for forming copper interconnect structure.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Besser et al. to US 2001/0051420 teach some claimed steps as illustrated in Figs.1-7.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hsien-Ming Lee whose telephone number is 703-305-7341. The examiner can normally be reached on M-F (9:00 ~ 5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 703-306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

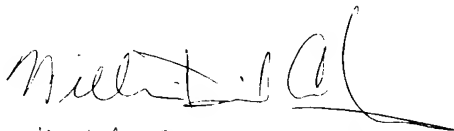
Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

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Hsien-Ming Lee
Examiner
Art Unit 2823

April 28, 2003


WILLIAM DAVID COLEMAN
Senior Examiner